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(30) Priority: **26.02.1999 DE 19908488**

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(54) **Method and apparatus for the reproduction of digital data streams**

(57) In DVB/MPEG transport streams, the PID specifies the assignment of the packets to the different elementary streams. For reproduction of the elementary streams, for instance by a set-top box with outputting via the screen of a television set, the packets of the desired program have to be selected from the transport stream by means of the PIDs using the demultiplexer. This requires in each case the evaluation of the Program Association Table and Program Map Table, and also that the PIDs of the elementary streams to be reproduced be known to the demultiplexer in the set-top box. If the set-top box has a digital interface via which parts

of the transport data stream can be stored and reproduced later or via which an arbitrary transport data stream can be fed to the set-top box, the demultiplexer must firstly be reprogrammed with the PIDs. Reproduction simply by the pressing of a reproduction (play) button is possible according to the invention, however, by virtue of the fact that the PID for the packets of at least one of the data streams is set to a predetermined value in the set-top box, the packets with this predetermined value of the PID being selected for reproduction.

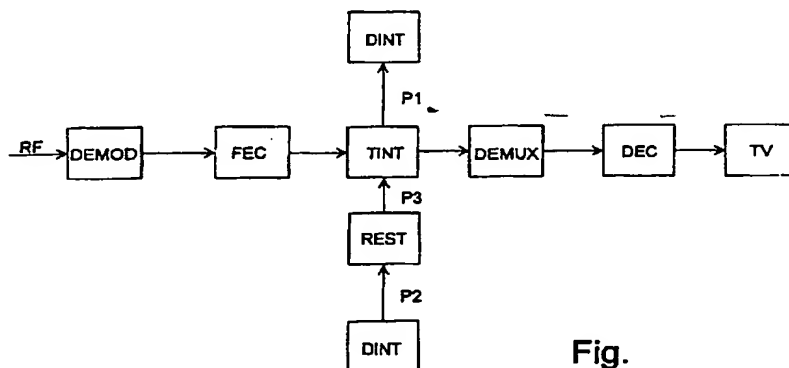


Fig.

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## EUROPÄISCHE PATENTANMELDUNG

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## (54) Verfahren und Vorrichtung zur Wiedergabe von digitalen Datenströmen

(57) In DVB/MPEG transport streams, the PID specifies the assignment of the packets to the different elementary streams. For reproduction of the elementary streams, for instance by a set-top box with outputting via the screen of a television set, the packets of the desired program have to be selected from the transport stream by means of the PIDs using the demultiplexer. This requires in each case the evaluation of the Program Association Table and Program Map Table, and also that the PIDs of the elementary streams to be reproduced be known to the demultiplexer in the set-top box. If the set-top box has a digital interface via which parts

of the transport data stream can be stored and reproduced later or via which an arbitrary transport data stream can be fed to the set-top box, the demultiplexer must firstly be reprogrammed with the PIDs. Reproduction simply by the pressing of a reproduction (play) button is possible according to the invention, however, by virtue of the fact that the PID for the packets of at least one of the data streams is set to a predetermined value in the set-top box, the packets with this predetermined value of the PID being selected for reproduction.

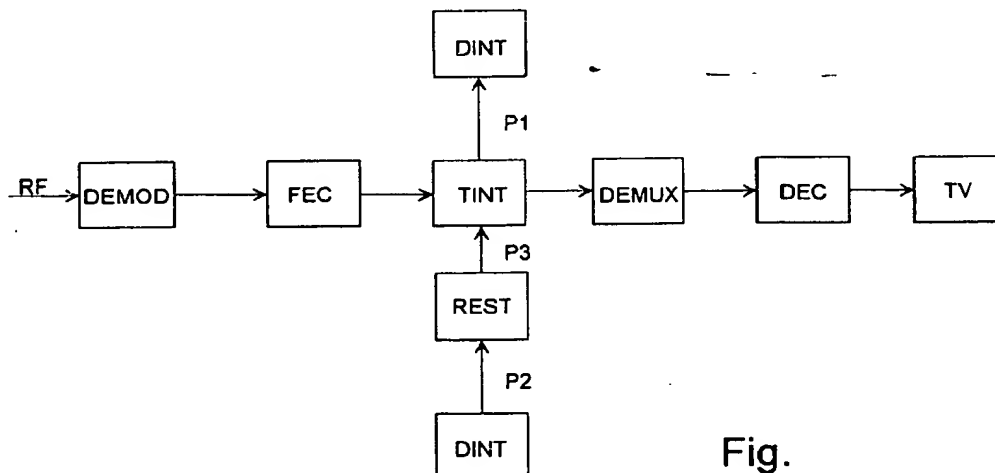


Fig.

with the IEEE 1394 Standard is additionally provided, which is connected to the transport stream interface, the digital interface converting the transport data stream into the IEEE 1394 format.

#### Drawings

[0012] An exemplary embodiment of the invention is described with reference to the figure, which shows a simplified block diagram of the apparatus according to the invention.

#### Exemplary embodiment

[0013] The figure illustrates one possible embodiment of an apparatus according to the invention. A received television signal RF is first of all fed to a demodulator DEMOD in the analog front end. The demodulation depends on the modulation method used and thus on the respective transmission channel. In the case of satellite transmission, QPSK modulation and demodulation, in particular, are considered in this context. The demodulated signals are fed firstly to error correction EDC and then to a transport stream interface TINT. The transport stream interface TINT filters one or more programs, according to the user's stipulation, out of the transport stream for recording on a disc- or tape-based digital storage medium, e.g. a hard disk. This can be done by the inputting of the associated PID numbers of the program or programs. Likewise, the selection may alternatively be made using a suitable menu displayed on the screen of the TV set TV. The transport stream P1 for the selected programs is then fed via a suitable digital interface DINT, which corresponds e.g. to the IEEE 1394 Standard, to a storage device (not illustrated here), e.g. a hard disk or a D-VHS recorder, and is recorded there. For a later reproduction of the stored data stream, the latter is first of all read in from the storage device via the digital interface DINT and fed as a transport data stream P2 to the restamp unit REST. In this case, if there are a plurality of recorded programs, it is necessary first of all to select the desired program or the desired transmission. The corresponding PID numbers for audio and video data and PCR are then determined for the desired program by means of the Program Association Table and the Program Map Table. Transport stream packets with the PID numbers determined are then restamped by the restamp unit REST, that is to say the packet identification in the header of the respective transport packets is changed to fixed numbers known to the system. The restamped transport stream P3 is then fed to the demultiplexer DEMUX via the transport stream interface TINT. The demultiplexer DEMUX then no longer has to evaluate the Program Association Table and Program Map Table for reproduction of the recorded data stream, since the same PID numbers are always present due to the restamping by means of the restamp unit REST, but rather can forward the data

stream directly to the MPEG2 decoder DEC. After decoding, display on the screen of the TV set TV can then be effected. For this purpose, the TV set may be connected to the set-top box e.g. by means of a SCART cable.

[0014] The restamp unit REST is preferably integrated in a set-top box, but may likewise be integrated in a recording device such as, for instance, a digital video recorder, a DVD-RAM or in the TV set.

[0015] The invention may be used for example in the context of a so-called TV memory function. The latter enables reproduction staggered over time in the following manner. In the event of an interruption during the viewing of a television program, e.g. due to a telephone call, the user initiates a command e.g. by pressing a corresponding button on the remote control, which leads to the storage of the subsequent program parts. For this purpose, the transport stream is output via the transport interface TINT and the digital interface DINT to a recording device, e.g. an integrated hard disk, and is recorded on the latter. Once the interruption has ended, the user issues a further command to initiate time-staggered reproduction of the recorded program starting at the point of interruption, and the program simultaneously continues to be recorded, e.g. until the end of the transmitted broadcast. Thus, simultaneously, the stored transport stream is read in via the digital interface DINT and the transport stream interface TINT and the transport stream currently being received is output via the same interfaces. In the case of the transport stream that is read in, the PIDs are in this case restamped in the manner described above.

#### Claims

1. Method for the reproduction of digital data streams, a plurality of data streams being joined together to form a transmission data stream for transmission and the data being grouped into packets, a packet containing, in addition to the useful information, a packet identification information (PID), which specifies which data stream the packet is to be assigned to, wherein the packet identification information (PID) for the packets of at least one of the data streams is set to a predetermined value which differs from the original value, and wherein the packets with the predetermined value of the packet identification information (PID) are selected for reproduction, characterized in that of the transmission data stream, using the packet identification information, one or more of the data streams are selected and recorded with unchanged packet identification information (PID) and, subsequent to the recording and before the reproduction of one of the data streams, the packet identification information is set to predetermined values.
2. Method according to Claim 1, characterized in

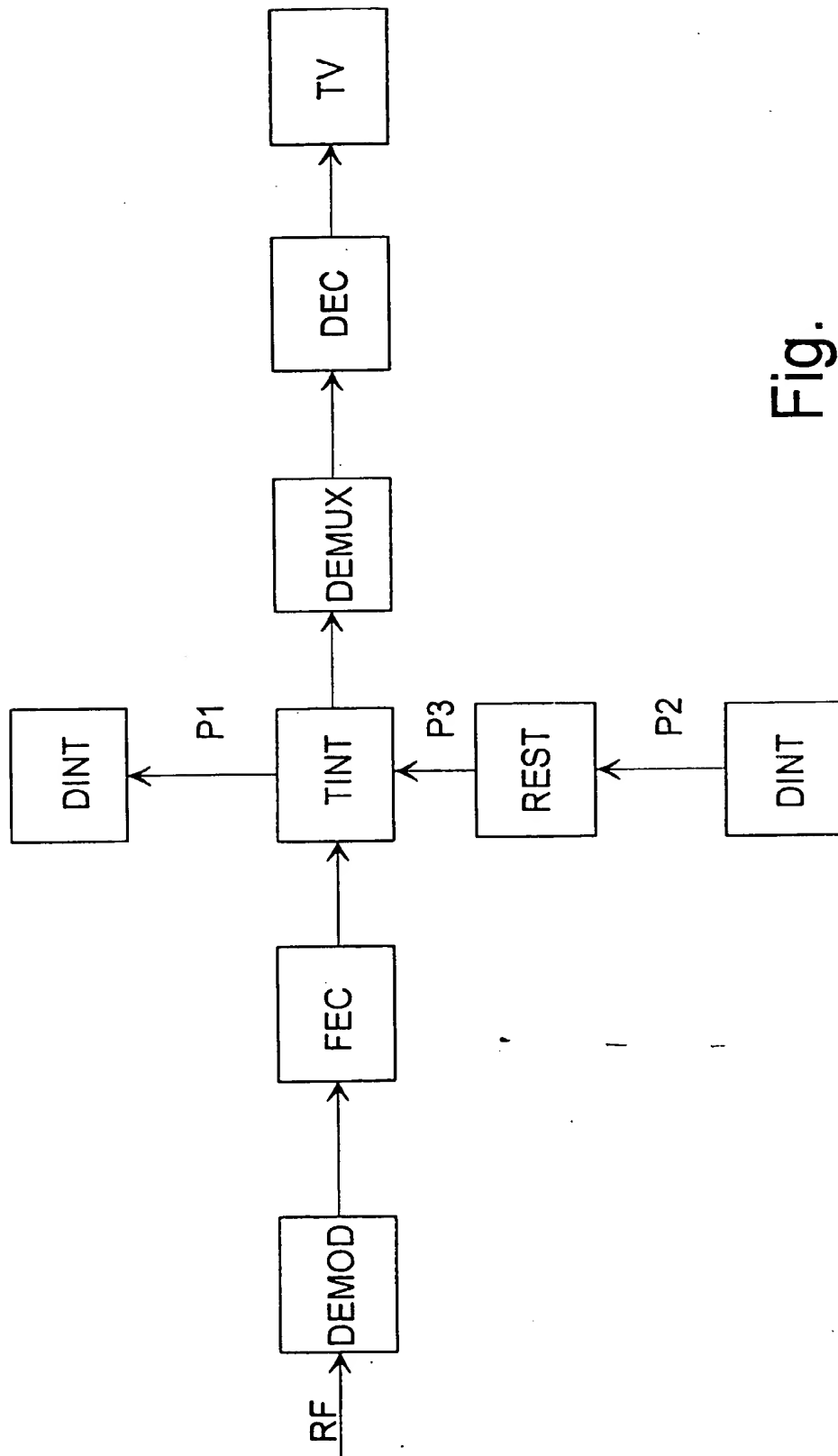


Fig.

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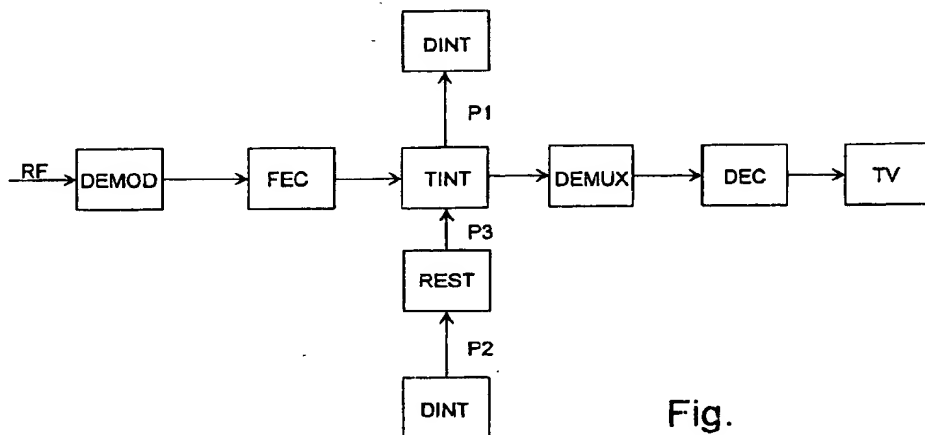


Fig.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 10 2938

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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18-09-2000

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